

R18

Code No:151AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
B.Tech I Year I Semester Examinations, December - 2018
CHEMISTRY

(Common to EEE, CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Give the reason for crystal field splitting of d-orbitals [2]
- b) Why do you express hardness of water in CaCO_3 equivalents. [2]
- c) Salt bridge is not required in Lead-acid storage cell. Explain. [2]
- d) Why Markownikoff's rule fails in the addition of HBr to propene in presence of H_2O_2 . [2]
- e) How many fundamental vibrations are possible in HCN, CH_4 . [2]
- f) Write the energy level diagram for N_2 molecule. [3]
- g) What is Caustic embrittlement? How do you present it? [3]
- h) Why coating of zinc on iron is called sacrificial anode. Explain. [3]
- i) How enantiomers differs from diastereomers. [3]
- j) Give reason why O_{16} , O_{18} , C_{12} do not exhibit NMR spectrum. [3]

PART - B

(50 Marks)

- 2.a) Explain about crystal field theory.
- b) Mention the difference between atomic and molecular orbitals. [5+5]

OR

- 3.a) Give an account of LCAO.
- b) Write notes on molecular orbital theory. [5+5]

- 4.a) Discuss the ion-exchange process of softening of hard water. How the exhausted resins are regenerated.
- b) Give the steps involved in the treatment of domestic water [5+5]

OR

- 5.a) What is the principle involved in complex metric method in estimation of hardness of water.
- b) Differentiate between scales and sludge's. [5+5]

AG AG AG AG AG AG AG A

6.a) How can you determine the pH of an unknown solution by using quinhydrone Electrode.

b) Iron corrodes faster than aluminum. Explain.

OR

7.a) Write an account of lithium ion batteries.

b) Explain the chemical reactions involved in electrochemical corrosion.

8.a) What are S_N^1 and S_N^2 reactions. Write the mechanism with suitable examples. Give their stereochemistry.

b) Explain different conformations of butane with the potential energy diagram.

OR

9.a) What are elimination reactions? Explain dehydro halogenations of alkyl halides with a suitable examples.

b) What is isomerism? How is it classified? Explain with suitable examples.

10.a) What are various electronic transitions? Give a brief note with suitable examples.

b) Write the basic principle of IR spectroscopy. Give various molecular vibrations in the technique.

OR

11.a) What are the selection rule in IR spectroscopy? Give any two applications of IR Spectroscopy.

b) What is the principle involved in Nuclear magnetic resonance Spectroscopy?

---ooOoo---

AG AG AG AG AG AG AG A

AG AG AG AG AG AG AG A

AG AG AG AG AG AG AG A

AG AG AG AG AG AG AG A